

4. The vortex inhibitor of claim 1 wherein molten metal is disposed within the hollow chamber upon introduction into the metal receptacle.

Remarks

Claims 1-25 remain in the application. Claim 4 has been amended to clarify the subject matter which Applicants regard as the invention.

The Examiner has objected to Claim 4 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants have amended Claim 4 to clarify the subject matter which Applicants regard as the invention. The claim now clearly sets forth that molten metal is disposed within the hollow chamber upon introduction into the metal receptacle. Applicants respectfully request reconsideration of this rejection in light of the present amendment.

The Examiner rejected Claims 1, 4, 9, 13, 14, and 23-25 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,451,036 to Eastwood ("the Eastwood reference"). The Examiner argued that Eastwood teaches a vortex inhibitor comprising a uniform refractory body having a generally tapering shape along a longitudinal axis from a base to a narrow end, and including a hollow chamber which may include a shaft and a sacrificial member connected to the uniform refractory body, thereby showing all aspects of the above claims.

However, Eastwood does not teach or recite a sacrificial member that is conditioned to deteriorate as defined in the claims. Rather, Eastwood is concerned with improving resistance to deterioration. Eastwood teaches "an improved dart, and an improved method of dart assembly, as compared with prior art proposals." (Column 1, lines 49-51.) The Eastwood reference recites, in the background section that "[c]onventional darts consist basically of ... an attached tail ... with at least a portion of the tail extending below the head and being adapted to engage in the tap hole of the furnace, the head acting in effect as a float

valve member and eventually closing off the tap hole as the level of the melt falls, to prevent slag exiting via the tap hole.” (Column 1, lines 9-17.) Eastwood admits that his invention practices the state of the art at the time to include an attached tail that acts as a float valve member for throttling flow through the tap hole. Additionally, Eastwood teaches encasing the tail refractory “in a metallic sleeve or jacket [to provide] considerably more strength than prior art proposals, as the metallic sleeve or jacket protects the refractory during handling.” (Column 2, lines 24-28.) Eastwood admits that the tail member of his invention is durable enough to “withstand the entire pouring process.” Eastwood uses “an elongate tail of refractory material” covering the easily mounted rod to improve the structural integrity and maintain its presence in the tap hole when immersed in molten metal in a discharging vessel. (Column 1, line 59.)

Conversely, Applicants’ claimed invention is drawn to an elongated sacrificial member that is conditioned to deteriorate and therefore minimizes the throttling effect admitted by Eastwood. The present invention includes a sacrificial member that dissipates before substantial throttling occurs and teaches a tail with less structural integrity. (Page 3, Lines 28-36.) The Applicants’ disclosure recites that “[t]he sacrificial elongated member may be constructed of hollow or solid metal and can be coated with a refractory material” (Page 5, Lines 11-12.), and the thickness of the refractory coating can be adjusted depending on the operating conditions of the metal receptacle, as long as the resulting member is conditioned to deteriorate while molten metal is discharged from the pouring vessel. Consequently, the sacrificial member does not interfere with the flow of molten metal through the discharge nozzle. (Page 5, Lines 17-18.)

Eastwood does not teach a sacrificial member conditioned to deteriorate. As a result, the claims of the present invention are not taught by the Eastwood reference. Applicants respectfully request reconsideration of this rejection in light of the present arguments.

The Examiner rejected claims 1-25 under 35 U.S.C. § 103(a) as being obvious from the teaching of the Eastwood reference. The arguments made above are equally applicable to this rejection. As applied to the Applicants' claims, the Eastwood reference and the knowledge of one of ordinary skill in the art does not render the Applicants' invention obvious. To the contrary, the Eastwood reference teaches an extending tail member with improved structural integrity that can withstand the entire pouring process. As such, the extending tail member of Eastwood throttles the flow of molten metal through the tap hole, thus decreasing the efficiency of the pour. The Applicants' invention represents a substantial departure from Eastwood by teaching an elongated sacrificial member that avoids throttling because the sacrificial member is conditioned to deteriorate before throttling the flow of molten metal through the tap hole.

The ordinary skill in the art recognizes deterioration of a tail and teaches how to avoid it by providing a reinforced tail with refractory material. In substantial departure from the prior art, the Applicants' invention teaches how to sacrifice structural integrity to avoid the throttling effect recognized by the prior art. The Applicants' invention teaches controlling the deterioration of the sacrificial member based on pour time and environmental conditions in the pouring vessel. As such, Claims 1-25, which all refer to a sacrificial member, are not obvious in view of the teachings of the Eastwood reference and the knowledge of one of ordinary skill in the art at the time the Eastwood invention was made.

The understanding that the claimed invention is obvious from the teachings of the prior art is hindsight guided only by the Applicants' present disclosure, and does not provide a proper ground for rejection under 35 U.S.C. § 103. Whereas Eastwood teaches a structure for improving the longevity and ease of constructing tailed, throttling elements, the present invention reduces structural longevity and avoids throttling. Applicants respectfully request reconsideration of this rejection in light of the present arguments.

In view of the foregoing, Applicants respectfully submit that the present application is now in condition for allowance, and such action is respectfully requested.

A check in the amount of \$55.00 is enclosed to cover the Petition fee of \$55.00. Please charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978 -- a duplicate of this paper is enclosed for that purpose.

Respectfully submitted,
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Attachment

VERSION WITH MARKINGS TO SHOW CHANGES MADE

4. The vortex inhibitor of claim 1 wherein molten metal is disposed within
the hollow chamber [carries metal core] upon introduction into the metal receptacle.